

**Transitional procedures:**

- If the FCC modifies the categorical exclusion that currently exempts paging operations, PageNet recommends that licensees of existing facilities be given sufficient time, such as until their next renewal, to evaluate and demonstrate compliance with the standards. (6)

**State preemption:**

- Not addressed.

**Other Issues:**

- Not addressed.

**RAYTHEON COMPANY**  
Comments on RF Environmental Guidelines Amendments  
(November 5, 1993)

**Interest:** Massachusetts-based manufacturer; no specific interest stated.

**Adoption of 1992 ANSI/IEEE Standard:**

- Raytheon supports the FCC proposal to adopt the new standard ANSI/IEEE C95.1-1992 to replace the older standard, ANSI C95.1-1982, in its procedures for "evaluating environmental significance." Raytheon believes that standards and regulations should be based on the best science and that the proposed new C95 standard represents a timely expression of the broad consensus of the scientific community (1).
- Raytheon believes the FCC should wholly adopt ANSI/IEEE C95.1-1992, and reject proposals for partial use of alternative guidelines. The 1992 standard represents the broadest consensus of the scientific community, and Raytheon believes that other standards, including "international" standards will follow this broad consensus. This trend was evident at a recent meeting in Rome where the C95 standard was chosen as an initial starting point for a NATO standard as well as other international guidelines. It should be remembered that the IEEE and its committees which developed the standard are "transnational" with a growing representation of overseas members (2).
- Raytheon believes the proposal to use more conservative guidelines in the presence of "modulation" should be rejected. There was no scientific rationale for this practice in the referenced NCRP guidelines authored in 1986 by a small group. Since then, there has been no developing basis for such a proposal.
- FCC adoption would strengthen the recognition and the resolve in the scientific and technological communities to continue the support of the C95 committees in their activities to ensure the availability of future revisions of this standard as befits a "living standard" (2).

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Supports "controlled" environment concept and "rejecting the thesis that 'certain subgroups of the population are more at risk than others'" (1).
- "Radio amateurs" meet the controlled criterion of "otherwise aware of the potential for exposure" (1).

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- Low power devices used in controlled environments should be excluded in accordance with the "exclusion rules set forth in the C95 standard."
- "Marine radar" should be excluded as "unlikely to expose users at or above the guidelines of the new standard" (2).

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**ROLM COMPANY**  
**Comments on RF Environmental Guidelines Amendments**  
**(August 13, 1993)**

**Interest:** Manufacturer of PBX and "other voice and data telecommunications terminal equipment," involved in research on "new wireless communications products," including wireless telephone products for the "1900 MHz band proposed for personal communications systems" (1).

**Adoption of 1992 ANSI/IEEE Standard:**

- Not addressed.

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- For uncontrolled environments the averaging time for computing MPE compliance is 30 minutes for 1900 MHz. It is telephone industry practice to assume that the typical maximum utilization of an individual telephone will be about 19.44%, corresponding to 7 centum call seconds (CCS) per hour, so that the typical exposure duration for a 30-minute averaging time will be less than 6 minutes. ROLM believes it is appropriate to use the typical maximum utilization, rather than 100% utilization, to calculate exposure duration (1).
- IEEE C95.3-1991, Appendix C, suggests several methods for the measurement of near-field SAR, including the use of implantable E-field probes, thermography and fabrication of simulated tissues. Because of the "measurement uncertainty" and the potential differences in results produced by these techniques, ROLM suggests "that it would be appropriate for the FCC to select one particular methodology for standardization prior to enacting the proposed regulation" (1-2).

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**SILLIMAN AND SILLIMAN**  
**Comments on RF Environmental Guidelines Amendments**  
**(August 3, 1993)**

**Interest:** Consulting engineers, Silver Spring, Maryland propose only a method of measurement for FM.

**Adoption of ANSI/IEEE Standard:**

- Not addressed.

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Commenters spell out a suggested method of measurement to determine compliance with ANSI/IEEE C95.1-1992 within the frequency range of 88 to 108 MHz for a limited controlled area such as a multiple station antenna location or a high building roof area, for which they desire approval (1-2).

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State Preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**SOUTHWESTERN BELL MOBILE SYSTEMS, INC.**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:** Cellular carrier providing service to a significant number of customers both in wireline and non-wireline markets.

**Adoption of 1992 ANSI/IEEE Standard:**

- Supports the FCC's proposed adoption of the 1992 ANSI/IEEE standard as it incorporates the latest scientific data relating to biological and environmental effects of RF radiation. (2)

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- It is logical to assign the less restrictive guidelines to a controlled environment where the amount, if any, of radiation exposure can be measured and the individuals involved are exposed knowingly. (2-3)

**Measurement and compliance procedures:**

- The term "radiated power" is incorrect. Instead, the FCC should use "effective radiated power", "equivalent isotopically radiated power" or "equivalent monopole radiated power." (4-5)
- If the standard is adopted as written, manufacturers should bear the burden of ensuring that the phones meet all the requirements under the ANSI/IEEE standard. (5)
- The FCC's rules should provide specific information on conducting and interpreting SAR measurements in order to calculate reportable values of SAR. For example, the rules should reference documents which show how to determine the appropriate duty factor of a transmitting device. (6)



- The FCC should encourage the industry to perform additional research in the area of defining appropriate electromagnetic field modeling tools as a more cost-effective alternative to measurement-based SAR analysis. (6-7)
- Any requirement regarding SAR laboratory testing may be unfair to the cellular industry as these tests will be more complex and expensive and the results will be less objective and subject to more debate than radiated power tests. (7)

**Categorical exclusions:**

- The standard should be clarified to indicate whether the provision specifying that "exclusions do not apply to devices where the radiating structure is maintained within 2.5 centimeters of the body" is applicable to hand-held cellular phones. (4-5)

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other Issues:**

- Not addressed.

**SPRINT CELLULAR COMPANY**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:** Interexchange carrier.

**Adoption of 1992 ANSI/IEEE Standard:**

- Supports the FCC's proposed adoption of the 1992 ANSI/IEEE RF exposure guidelines for use in evaluating the effects of RF radiation on both workers and the general public as such adoption is in the best interests of the telecommunications industry and the public. (1)

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Although the guidelines specify definitive limits for allowable RF exposures for controlled and uncontrolled environments, the components of these environments should be more fully defined to assist licensees in limiting the public's access to controlled environments. (6-7)

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- The categorical exclusions for cellular base stations and microwave facilities should be maintained as: (1) normal and routine operations of cellular base stations and microwave facilities would not cause exposures in violation of the 1992 standards; and (2) eliminating the categorical exclusion would impose severe burdens on licensees. (3-4, 5-6)
- Possible excessive worker exposure does not warrant ending categorical exclusions. Licensees should be able to certify that processes have been established to preclude

excessive worker exposure, and the FCC should establish guidelines for such procedures. (4-5)

- Supports a low power device exclusion based on radiated power as it has a more direct correlation than input power with the environmental effects in question. (7)
- Supports the FCC's request for a formal interpretation from the IEEE as to whether the formula used to determine the exclusion could be extrapolated to 2200 MHz to cover hand-held PCS devices. (8-9)

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:** National trade association representing manufacturers and suppliers of telecommunications equipment.

**Adoption of 1992 ANSI/IEEE Standard:**

- Endorses the new standard and demonstrates how the C95.1 findings can be practically implemented in the context of the mobile radio environment. (1)
- Alternate guidelines should be disregarded since the IEEE C95.1 report intentionally omitted the modulation restriction suggested by NCRP. (25-27)

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Use of radios licensed under Part 90 should be classified as occurring in the controlled environment and use of mobile and portable cellular radios licensed under Part 22 should be classified as occurring in the uncontrolled environment. (2-8)
- The new Part 99 service is expected to be similar to the Part 22 service and thus should also be included in the uncontrolled environment. (8)

**Measurement and compliance procedures:**

- To minimize ambiguities, TIA recommends that the FCC adopt the IEEE definition for radiated power output -- the average power output available at the antenna terminals, less the losses of the antenna, for any combination of signals transmitted when averaged over the longest repetitive modulation cycle. (10)
- Suggests using the services of an independent test laboratory to develop an appropriate measurement procedure and facility and offers to act as the focal point

for the development of such necessary standards, using its normal ANSI accredited standards setting process. (11)

- Recommends the FCC use its routine equipment authorization process as the vehicle for reporting SAR compliance. Suggests including a box that the applicant could check to certify compliance or allowing an applicant to attach a separate exhibit including the same information. (12, 29)

**Categorical exclusions:**

- Urges the FCC to take appropriate steps to modify the low power exclusion limit to reach frequencies as high as 6 GHz. (10-11)
- Land mobile radio should remain categorically excluded from environmental evaluation based on the absence of contradictory evidence. (18-24)

**Transitional procedures:**

- Recommends that all existing land mobile radio units be indefinitely grandfathered. (28)
- Recommends that the effective date for compliance with the rule for portable radio units be two years after competitive and commercially available SAR measurement laboratories are established. (29)
- Believes the FCC's indicated spacings required to assure that people in an uncontrolled environment are not subject to RF energy levels exceeding the 1992 ANSI standard are significantly overstated and provides its own analysis. (31-33)

**State preemption:**

- The FCC should initiate a further proceeding to clarify federal preemption rules. (34-35)

**Other issues:**

- The Holladay petition seeking to prohibit the sale of all hand-held telephones and radios that operate between 400 and 1300 MHz pending evaluation of any health risk should be dismissed as it does not meet the FCC's most basic requirements. (13-17)

**TELOCATOR**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:** Association representing the personal communications industry comments with emphasis on PCS-related matters.

**Adoption of 1992 ANSI/IEEE Standard:**

- Telocator concurs with the FCC's tentative conclusion to revise its NEPA rules to reflect the 1992 ANSI/IEEE guidelines, which are preferable to the alternatives discussed in the NPRM (2-3).

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Telocator believes that the ANSI/IEEE standard itself clearly defines controlled and uncontrolled environments so that separate FCC action is not needed (11).

**Measurement and compliance procedures:**

- Measurement of SAR within 20cm of an object is unclear under the standard and will cause problems if required (6-7).
- Responsibility for demonstrating compliance of any portable mobile radio unit (that is not exempt under a low power exclusion) should be imposed on manufacturers through the equipment authorization process (4-5).
- The FCC should mandate that portable units that only meet the limits for controlled environments should be labeled by their manufacturer with suitable instructions and other appropriate warnings (11).

**Categorical exclusions:**

- The agency should continue the low power exclusion for all land mobile portable devices; until the IEEE clarifies the rules for 2 GHz devices, the new PCS handhelds should continue to remain exempted (5-8).
- Vehicle-mounted mobiles and base stations should remain exempted, because "standoff" distances are small and the facilities typically are shut down when workers are near antennas. It would be appropriate to condition licenses to require shutdown of high-power base station and mobile transmitters when workers are expected to be near for prolonged periods (8-10).

**Transitional procedures:**

- All existing equipment authorizations should be grandfathered. After the date of adoption of the rules, new devices subject to equipment authorization should be required to comply with the 1992 standard (12).

**State preemption:**

- Not addressed.

**Other Issues:**

- Not addressed.

**TRW, INC.**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:**                    Satellite telecommunications company.

**Adoption of ANSI/IEEE Standard:**

- TRW supports use of the ANSI/IEEE guidelines over those issued by the NCRP and the International Non-Ionizing Radiation Committee of the International Radiation Protection Association (12-13).

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- On the following grounds, TRW challenges the FCC's proposal to treat most hand-held devices under the "uncontrolled environment" standard unless the user is aware of the exposure potential as a concomitant of employment: (1) the power radiated by these devices is such that the actual user is the only person likely to be exposed to radiation; (2) the handset used with TRW's "Odyssey" system emits radiation in short, random bursts, resulting in exposure to the user that is only transitory; (3) many hand-held devices are consumer products that happen to have numerous business applications -- employment has little to do with how the device will be used; and (4) with sufficient warnings and use instructions, the potential exposure from the hand-held devices can be reduced to negligible levels for users, thereby eliminating the risk of exposure for non-users (6-9).
- Based on the above, the FCC should revisit its proposal or at the very least regulate the handsets for use with TRW's Odyssey system under the controlled environment guidelines for all users (9-10).
- The FCC should similarly regulate MSS handsets in the MSS/RDSS service under the "controlled" environment standards (10 n. 4).



**Measurement and compliance procedures:**

- TRW urges the Commission to develop a single, unambiguous test that all manufacturers of a particular product type can use to ascertain compliance. The Commission could either specify a particular test apparatus and procedure for measurement or certify independent testing laboratories or facilities to perform the measurements for all manufacturers (15).

**Categorical exclusions:**

- TRW supports the FCC's proposal for the exclusion of low power devices, but asks the Commission to clarify: (1) that "radiating structures" are defined as "pieces of electrically conductive material which are larger than one-eighth of the shortest wavelength of the emitter [which] are 2.5 cm or closer to the antenna"; and (2) that SAR measurements must be based on unambiguous field strength readings at specific frequencies and distances from the subject device (11-12).

**Transitional Procedures:**

- TRW urges the FCC to require measurement and recertification of existing equipment and facilities for those industries where new receivers must be developed or used to adjust to lower-power transmitters necessitated by the new RF rules. Grandfathering is acceptable where older, higher-power transmitters do not negatively affect new lower-emission devices (13-14).

**State Preemption:**

- Not addressed.

**Other Issues:**

- Not addressed.

**UNITED STATES TELEPHONE ASSOCIATION**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:** Trade Association representing the interest of local telephone companies.

**Adoption of 1992 ANSI/IEEE Standard:**

- Absent any adverse comments or findings filed by the expert health and safety agencies, USTA agrees with the Commission that these new guidelines appear to be more up-to-date with respect to scientifically-based criteria to be used in evaluating human exposure to RF radiation, and will ensure that Commission-regulated facilities and devices comply with the latest safety standards for RF radiation exposure (1-2).

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Responds to the NPRM's suggestion that more than a simple "No" may be required on application forms where no significant environmental impact is claimed. USTA argues that point-to-point microwave facilities generate "virtually no harmful effects." Under these circumstances, it does not make good sense to arbitrarily require carriers to perform costly radio hazard studies on a routine basis, or to collect data to verify a potential adverse impact that may never exist. The costs of the studies and the additional time in reviewing them will greatly burden Commission and carrier resources. Rather, USTA suggests that for low radiated power radio communication systems or devices, the presumption should be that their normal RF emissions do not generate health or environmental hazards. Thus, an applicant should not have to file routinely any supporting environmental documentation unless the Commission makes a finding that the presumption should not be available in a particular instance. In that circumstance, the Commission

should contact the applicant and request a showing, determined on a case-by-case basis (2-4).

**Categorical exclusions:**

- The radiated power normally used by local exchange carriers to provide point-to-point and other radio communications services such as cellular, paging and wireless devices is extremely low compared with the radiated power used by radio and television broadcasters. For example, cellular phones and pagers generally have radiated power of a few hundred watts, whereas, broadcast radio and television often have radiated power of many kilowatts. Because of the extremely low radiated power levels from carrier-provided communications devices, the amount of microwaves and other radio frequency fields that can cause harmful radiation effects to humans as well as to the environment is negligible. In other words, there are virtually no harmful effects generated from these carrier-provided radio systems and devices (3).

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**UTILITIES TELECOMMUNICATIONS COUNCIL**  
**Comments on RF Environmental Guidelines Amendments**  
**(November 12, 1993)**

**Interest:** Represents 2000 "electric, gas, water and steam utilities" and pipelines. Members operate "private land mobile and microwave systems" which would be affected (2).

**Adoption of 1992 ANSI/IEEE Standard:**

- Favors adoption of the "entire standard" including "the provisions for exclusions of certain types of devices or services" (1).

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- "UTC supports application of different levels of exposure for controlled and uncontrolled environments." However, the FCC should not "be overly conservative in the application of these definitions." UTC favors application of the uncontrolled environment standard only where there is a "reasonable possibility of RF exposure to the general public" (3-4).
- UTC opposes the rigid "automatic" determination that all RF sources in residential areas be considered "uncontrolled," as proposed by the Commission. Rather, "in situations where the proximity of the general public is restricted, the FCC should determine a minimum acceptable distance between RF sources and the 'general public' as a benchmark for determining the classification of the environment" (4-5).

**Measurement and compliance procedures:**

- Equipment manufacturers should be required to demonstrate compliance at the time of type acceptance (8).
- Licensees should "be provided with the flexibility to use any one of a variety of methods to demonstrate compliance with the 1992 standard," including "surveying

the facility or transmitter site with an applicable electric and magnetic field probe/RF field hazard meter," "performing calculations of RF field levels based on acceptable engineering standards and practices," and implementing operating practices that would limit times of exposure or access to RF sources" (9).

- If private land mobile and private microwave facilities are not categorically excluded, the FCC should alternatively permit applicants to certify they "(1) are aware of the 1992 standard; (2) do not have any information that would indicate that their radio equipment would be operated in a manner that would cause exposure in excess of the 1992 standard; and (3) will engage in periodic training and adopt appropriate operating practices to minimize the possibility of exposures that would exceed the standard" (7-8).

**Categorical exclusions:**

- UTC opposes the Commission's proposal to require all low-power devices to meet the exposure levels for uncontrolled environments in order to be excluded. The safety factor of ten in the controlled environment standard provides "a wide margin of safety" and the FCC should not "second-guess" the ANSI and IEEE experts in this area (5-6).
- Private land mobile and private microwave facilities should continue to be exempt because "they are likely to comply with the 1992 standard" and "demonstration of compliance is cumbersome or impractical" (6-7).

**Transitional procedures:**

- UTC proposes that "licensees with existing systems be given a reasonable period of time to amortize the equipment before replacement is required." In the meantime, "licensees should be required to adopt appropriate operating procedures to limit unnecessary exposures" (8-9).

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**LOUIS A. WILLIAMS, JR. AND ASSOCIATES**  
Comments on RF Environmental Guidelines Amendments  
(September 17, 1993)

**Interest:** A Cincinnati, Ohio, "professional engineer providing consulting and measurement services" who has experience with "single and multiuser towers" for radio and TV stations.

**Adoption of ANSI/IEEE Standard:**

- Stay implementation of induced and contact currents standards (2).

**Induced currents:**

- See measurement and compliance procedures.

**Contact currents:**

- See measurement and compliance procedures.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Mr. Williams is not aware of any commercially available equipment that can be used safely by a climber to measure induced or contact currents. Perhaps the best course of action if the ANSI C95.1-1992 standard is adopted is to stay the enforcement of the induced and contact current provisions above 45 MHz until further notice (2).

**Categorical exclusions:**

- There are sites where one or more antennas for categorically excluded transmitters are present in a relatively confined and accessible space so as to constitute a potential risk. The categorical exemption should be limited to those situations where the applicant can certify that there is minimal risk. For example, the applicant could be required to certify that accessibility to the applicant's antenna within a specified distance is controlled during operation, that there are no other categorically excluded transmitting antennas within a second specified distance of the applicant's antenna, and that no noncategorically excluded (AM, FM, TV, etc.) transmitting antennas are within a third specified distance of the applicant's

antenna. The specified distances would be safe thresholds within which additional investigation would be necessary; that is, the exemption would not apply (1).

**Transitional procedures:**

- Not addressed.

**State Preemption:**

- The Commission should give serious consideration to a limited preemption of non-federal regulations setting RFR limits different from those set by the Commission. Such a limited preemption would apply unless the Commission granted a waiver to the agency desiring to impose a nonconforming requirement (2).

**Other issues:**

- Not addressed.

**VILLAGE OF WILMETTE, ILLINOIS**  
**Comments on RF Environmental Guidelines Amendments**  
**(November 24, 1993)**

**Interest:** Cook County "Illinois municipal corporation" replies to the petition of Sheldon L. Epstein in this docket requesting preemption of Wilmette "resolution" setting RF exposure guidelines (1).

**Adoption of 1992 ANSI/IEEE Standard:**

- Not addressed.

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Wilmette, which has the "same authority as the state legislature to exercise police powers," had adopted "Resolution 93-R-34" which "sets forth non-binding guidelines for public exposure to radio frequency (RF) radiation for new installations of cellular telephone transponders," "intended to assist local zoning officials." The standard, "derived from a study in which Ameritech placed a test



transponder in an elevated location in the Village," seeks to "implement a public health and safety policy of 'prudent avoidance'" (1-3).

- The reply says Epstein's petition for preemption misstates the facts about Wilmette enforcement activities and that the resolution does not prohibit either TVRO antennas or cellular transponders (3-5).
- The resolution is not subject to preemption, because it is consistent with preemption rules announced in Capital Cities Cable, Inc. v. Crisp, 467 U.S. 691 (1984) in that it "does not prevent a license holder from reasonably exercising the activity permitted by the Commission" (6-7).

**Other issues:**

- Not addressed.